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customs and ideas of to-day have roots in the past which are hardly suspected by the general public. On the whole, the book makes melancholy reading, unless one can enjoy the contrast between ancient follies and our own astonishing superiority! The study of past error and confusion is certainly of value as exhibiting the weak spots in our social organism, and enabling us to be on our guard against early symptoms of decay in the societies to which we belong. Thus, the author says:

"If one attempt to scan the field of the history of medicine, to take note of all the fallacies and superstitions which have befogged men's minds, and brought about what *now* seem to be the most absurd and revolting views and practises of times gone by, and if one search deliberately for that which is of curious nature, or calculated to serve as a riddle difficult of solution, he will scarcely in the tomes which he may consult find anything stranger than the close connection, nay, even the identity maintained for centuries, between the trade of the barber and the craft of the surgeon. Even after having studied history and the various laws passed at different times, he will still miss the predominant yet concealed reason for this state of affairs. This will be found to be, in the words of Paget, the 'maintenance of vested rights as if they were better than the promotion of knowledge.'"

It is impossible to contemplate this history without asking whether to-day the "concealed reason" mentioned by Paget is not still powerful, and serving to prevent our academic institutions from readily adapting themselves to their social environment. From another point of view doubt may be expressed as to the complete validity of the author's historical method. From time to time we find fault with the professional historian, who, depending on documentary evidence, seems to over-emphasize the miseries and stupidities of former days. We like better our Morris and Scott, who offer us pictures of moving life, full of romance, adventure and high ideals. It is easy to criticize such writings, as we criticize the landscape artist who makes idyllic pictures of

suburban lanes, leaving out the tin cans, dead cats and evil smells. Yet after all, life was life in those days, and the best that is in us calls across the ages to the best that equally existed in our ancestors. Dr. Park's accounts may be true as to facts, and yet to some extent misleading to those who have not other sources of information.

T. D. A. COCKERELL

BEETLES BECOMING PARASITES

IN all the great group of beetles, 50,000 species strong, and of an extraordinary variety of external appearance and of habit, witnessing to a ready plasticity and adaptiveness, there are but few indications of a resort to parasitism as a shift for a living. The *Stylopidae*, it is true, are parasites (in the bodies of wasps, bees and leaf hoppers), but these insects are no longer considered to be aberrant beetles, but to constitute a quite distinct order, more nearly allied to the Hymenoptera or Diptera than to the Coleoptera.

The classic and single conspicuous example of a parasitic beetle, living all of its life (both larval and adult) on its host, is the well-known beaver parasite, *Platypusylla castoris*, common both in Europe and America. This insect lives as an external parasite among the hairs on the outside of the host's body, and feeds on the hairs and dermal scales, just as the Mallophaga (biting bird lice), of birds and mammals, do. It has a highly modified body, and is the only species of its genus and family.

Another small beetle, however, *Leptinus testaceus*, of the family Leptinidae, is known in both Europe and America as a frequenter of the nests of field mice, shrews and other small mammals of similar habit. It has also been taken from humble bees' nests. I have recently received several specimens of this beetle which were taken from the bodies of freshly killed shrews on Forrester Island, Alaska, by Professor Harold Heath. The beetle's body is not modified (by flattening, fusion of thoracic segments, etc.) in any such extreme way as is that of *Platypusylla* or the Mallophaga, but it shows, nevertheless, the

beginnings of such adaptive modification, and suggests plainly that the beetle's habits are probably already those of a habitual external parasite of its shrew and field mouse hosts, feeding (with simple biting mouthparts) on the dermal scales and hair.

Professor Van Dyke, of the University of California, our foremost Pacific coast student of the beetles, and from whom I have most of the information used in this note, writes that from the fact of finding *Leptinus* in the nests of bumble bees a number of entomologists have advanced the idea that the beetle lives normally in bumble bee nests and becomes accidentally carried from them by mammals that raid the nests. "This I do not agree with," says Dr. Van Dyke. Considering all of the circumstances of the few captures that have so far been made of the beetles, Dr. Van Dyke concludes that the beetle is a real parasite of the mice and shrews and "absolutely dependent on them in the same way that the Mallophaga are dependent on their hosts."

Another little beetle, *Leptimillus validus*, closely related to *Leptinus*, occurs on beavers in the Hudson Bay region. Still another beetle, *Lyrosoma opaca*, a Silphid (carrion beetle), is found in the North Pacific upon practically all of the islands and isolated ocean rocks to be found there. It breeds in rotten kelp and among old and broken murre's eggs, etc., and has been found prowling about the tenanted nests of the murre's. But it is wingless, and Dr. Van Dyke believes that it is carried from island to island and rock to rock by the roosting and breeding birds of these rocks and islands, the beetles accidentally seeking shelter among the feathers of brooding or perching birds, and thus being carried off by them when they take to flight. "Only in this way," writes Professor Van Dyke, "can I account for the presence of the beetles on Bogoslov Island [the famous recent volcanic island of Alaska], for this island is but little over one hundred years old, and the insects are so delicate that they could not possibly survive longer than a few minutes in the Arctic waters."

These stages in the change from a scav-

enger's life to that of an external parasite, shown by the series of beetles referred to in this note, are exactly parallel with the transition stages from the wingless Atropids (*Procidæ*) feeding on dry bits of dead organic matter, even to the feathers and organic detritus in birds' nests, to the Mallophaga, feeding on the same bits of feathers and dermal scales, but finding them on the bodies of the birds themselves, to whom they have come to bear the relation of permanent external parasites, with no longer any capacity to live off their hosts. The next step for some of the beetles to take would be to become like the Anoplura, and find a more acceptable food in the blood of the hosts. For this their mouthparts would have to be considerably modified, but that would be no difficult matter.

VERNON L. KELLOGG

STANFORD UNIVERSITY, CALIF.

SPECIAL ARTICLES

THE DECOMPOSITION OF SOIL CARBONATES

It has been found at the agricultural experiment station of the University of Tennessee, that excessive amounts of magnesium carbonate were entirely decomposed when left in contact with fallow soils in pots protected from leaching. Three types of soil were used, and the amounts of chemically pure precipitated carbonate of magnesia, equivalent to 16,000 pounds per acre of calcium carbonate were applied, in excess of the lime requirement, as indicated by the Veitch method. One year after the application the soils were analyzed and found to be strongly alkaline, but practically free of carbonates. Repetition of the experiment in metal rims, using 32,000 pounds of magnesium carbonate per acre, under field conditions, afforded the same observation in every one of eight treatments, four with magnesium carbonate alone and four with carbonate supplemented by manure, the analyses being made in this series after an eight weeks' period of contact. This work was begun in the spring of 1912 and final analyses were made in August, 1913.

It has hitherto been held that the conver-